4.3 CULTURAL RESOURCES

Impacts to the cultural resources of the VPA would primarily result from activities associated with surface and subsurface disturbance such as development projects, recreational use/OHV travel, and fire management. Impacts may, however, result from specific cultural resource management decisions and from non-surface disturbing activities that create visual and/or auditory effects. These latter impacts would apply primarily to sites or locations deemed sacred or traditionally important by Native American tribes and used by these groups in such a manner that visual obstructions and/or noise levels impinge upon that use.

Because the majority of cultural resources that have been identified in scoping consist of archaeological sites, the primary concern for negative impacts relates to disturbance of the artifacts, features, architecture of sites in ways that reduces their integrity, alters their association with traditional values, and reduces the potential to recover data. Archaeological data consist of both "objects" (in the broad sense of artifacts, architecture, features, etc.), and the horizontal and vertical relationships between these objects. Our ability to interpret and understand the past is based on recovering not only the material culture of the past in the form of artifacts, buildings, and the built environment but the spatial relationships between different aspects of material culture. Thus, surface and subsurface disturbances, which can not only destroy material culture but also destroy the spatial relationships that are key to interpreting that culture, have the greatest potential for negative impacts on cultural resources. Impacts can include elimination or reduction of the setting and physical integrity of a sacred or other site, including National Register-eligible sites, landscapes and cultural theme areas, disruption or reduction of the religious values of sites and areas, reduction in the data potential of a site, and damage to traditional collection areas or resource sites. In general, impacts on cultural resources from surface disturbance are long-term in nature; once an archaeological site has been impacted, the affect typically cannot be reversed. Short-term effects from visual or auditory impacts may occur, however, and can often be ameliorated or accommodated.

Potential impacts to cultural resources from the various proposed management alternatives are difficult to quantify precisely. The management plan neither stipulates precise areas for surface disturbing activities nor are the precise locations of all resources in the zone known. However, it is possible to estimate impacts based on the proposed general locations of activities and the relationships of these planning areas to zones of higher and lower probability for cultural resources. As discussed in Chapter 3, a geographical model of high and low cultural resource site probability has been built utilizing proximity to water, sand dunes, pinyon-juniper zones, historical mining districts, and slope. All areas within approximately 1 km of permanent water, or within pinyon-juniper vegetation zones, or within areas of sand dunes, or within the general area of historical mining districts were considered high site probability zones (encompassing approximately 2.7 million acres over the entire region, with about 708,000 acres within BLM lands). Areas with greater than 30 percent slope, or not having any of the high site probability factors were considered low site probability zones (encompassing approximately 2.8 million acres, with about 1.2 million acres within BLM lands). Planning areas and actions in the following sections are therefore assessed with regard to how much of the proposed action is likely to result in surface disturbing activities within these zones. While not precise, this method enables a quantifiable assessment of probable relative effect(s) of planning actions.

Furthermore, in a number of cases, it is also possible to estimate the number of sites that would become either identified or involved in particular types of proposed actions. Class II cultural resource inventories in the Vernal area during the 1970s identified the average number of sites per square mile in zones of high and low cultural resource sites (see Spangler 1995:228-240). These ranged from estimates of 0.13 sites/square mile in low site occurrence zones in the Red Wash II survey area (Spangler 1995:233) to 6.5 sites/square mile in high site probability areas in the Seep Ridge survey area (Spangler 1995:236). A conservative average of these surveys results in an estimation of 4.87 sites/square mile in high site probability zones and 0.93 sites/square mile in low site probability areas. For estimating sites along linear projects crossing small portions of these zones, the midpoint between these ranges of 2.9 sites/square mile is used. It must be stressed that the estimates are based on averages of results from different surveys, are based on a number of assumptions, and are therefore best considered a means of gauging relative impacts under each alternative. They should be considered a means of determining the order of magnitude for numbers of sites involved, rather than precise estimates of known numbers of sites.

Impacts on cultural resources may be indirect and negligible from alternative decisions related to forage management, air quality, livestock grazing, riparian area management, soils and watershed management, special status species management, visual resource management, and wild horse and wildlife management. As such, they will not be discussed further in this analysis. All other alternative decisions with the potential to impact cultural resources either positively or negatively in a significant way are discussed below.

4.3.1 Impacts Common to All Alternatives

All alternatives will comply with federal laws and agency guidelines governing the identification, evaluation, and protection of cultural resources and Native American sacred/traditional sites and trust assets, including, but not limited to, the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act (AIRFA), and Executive Orders 13175 and 13007. All undertakings under all alternatives are subject to compliance with Section 106 of the NHPA, which mandates the consideration of avoidance or mitigation of adverse impacts on cultural resources or traditional cultural places that are either listed on or have been determined eligible for the National Register of Historic Places (NRHP). Additionally, under all alternatives, the BLM will monitor overall environmental and resource health and will adjust land uses according to the prescriptions set forth in the RMP to provide for healthy and stable resource conditions.

In general, actions common to all alternatives are philosophical or procedural in nature and do not include specific actions for which impacts on cultural resources can be assessed. However, some decisions crossing all alternatives are specific enough to identify potential impacts from them on cultural resources. The effect of non-cultural resource related management decisions common to all action alternatives on cultural resources can be categorized as those having a potential direct effect and those having a potential indirect effect. Management decisions common to all alternatives that allow for surface and subsurface disturbance, such as securing abandoned mines (many of which are historic), and using chemical, mechanical, and prescription fire treatments to manage the effects of wildland fire. Owing to insufficient data related to the very small percentage of the VPA that has been inventoried for cultural resources, the exact impact of such decisions on specific cultural resources cannot be quantified. Adverse impacts

from such activities can be avoided or mitigated through adherence to the Section 106 process of the NHPA.

Although it is not possible to precisely estimate the impacts of the decision to allow motorized vehicle use on a single track up to 300 feet off of designated roads or trails, it is possible to provide a general estimate. To determine potential impacts in areas where travel is limited to designated routes and 300 feet away from each route, a 300-foot zone was established on either side of the designated routes for each alternative, and the acreages within areas of high and low cultural resource site probability were calculated accordingly for each alternative. The results of this analysis are provided in detail in Section 4.3.2.8, as they are directly related to travel decisions along these routes. In summary, the analysis suggests that although the action would leave an indeterminate number of cultural resource sites potentially subject to continued impacts or new impacts, because the number of open routes would be reduced under all alternatives except the No Action Alternative (e.g. Alternatives A, B, and C), the number of sites potentially subject to continued or new impacts would be reduced unless the no-action alternative is selected. Because a large number of routes are open at the present time, and therefore impacts may be presently occurring, reducing the number of open routes reduces the number of sites potentially reduces the potential new or ongoing disturbance to cultural resource sites, and therefore this prescription is generally beneficial to cultural resources. Monitoring of impacts from the guideline should help to reduce continuing or new impacts further.

Conversely, many common management decisions have direct positive impacts on cultural resources. In particular, the decision to treat vegetation around important archaeological sites so as to reduce the probability and severity of wildland fire impacts on sites provides a direct positive benefit to the subject archaeological sites by helping to protect those values that render them significant. Other types of management decisions have potential indirect impacts on cultural resources. For example, management decisions that call for enforcing land use permits to insure no incidental surface and subsurface disturbance, maintaining appropriate grazing/forage AUMs to insure stable vegetation cover thereby reducing erosion, requiring dispersed camping, providing for the management of paleontological resources through the issuance of collection permits and closing areas to hobby collecting, or limiting activities in areas of biological soil crusts or special designations, provides an indirect benefit to cultural resources by reducing surface and subsurface disturbance and placing tighter controls on some land uses.

Understandably, the actions common to all alternatives that have the greatest direct impact on cultural resources are those related specifically to said resources. The cultural resource decisions common to all alternatives are designed to follow federal law and agency guidelines and to protect the values of cultural resources that make them important, whether these are public values, scientific values, conservation values, experimental values, or traditional values. As such, these decisions common to all alternatives would be made within a decision-making environment that requires balanced stewardship of cultural resources within the VPA. In particular, these decisions must consider human burials and associated burial goods under both the NAGPRA and the ARPA. The decisions also insure adherence to the Section 106 process of the NHPA for all BLM authorizations of land and resource use and codify the importance of appropriate levels of consultation and interaction with Native American tribal groups to assure that the concerns of indigenous peoples are addressed and their rights protected as the BLM makes management decisions.

Special designations, such as SRMAs, ACECs, WSAs, and Wild and Scenic Rivers, common to all alternatives should also afford indirect benefit to cultural resources through the restriction, in some cases, of surface disturbances as part of the designation. The seven existing ACECs in the region, Browns Park, Nine Mile Canyon, Red Mountain-Dry Fork, Red Creek Watershed, Pariette Wetlands, Lower Green River Corridor, and Lears Canyon, will be maintained under all alternatives. The ACEC designation will provide some protection through additional scrutiny. Furthermore, the Pariette Wetlands and Lear's Canyon ACECs will be managed as NSO, which should also reduce potential impacts to cultural resources. The Pelican Lake SRMA is designated NSO under all alternatives, which should afford protection to cultural resources. Wild and Scenic River designations, such as the existing Upper and Lower Green River designations, also offer indirect benefit as these areas are managed as NSO one-quarter-mile from center line of the river as per the Wild and Scenic Rivers Act.

4.3.2 Alternative Impacts

Proposed actions under each alternative have the potential for different degrees and kinds of impacts on cultural resources within the VPA. It must be remembered, however, that regardless of the level of potential impacts under a given alternative, decisions with the potential to impact cultural resources that would require further permitting or analysis, such as permitting particular oil and gas operations, developing rangeland improvements such as guzzlers or fences, conducting a prescribed burn, or developing a campground are subject to the Section 106 process of the NHPA before they can be authorized. As part of this process, if it is determined that there are any known or potential impacts to cultural resources that are either listed on or have been determined eligible for listing on the NRHP, alternatives must be developed that would avoid, minimize, or mitigate adverse effects on historic properties. Because of these protective measures, over management of the area in the past there have been minimal negative impacts to cultural resources. It is frequently possible to identify resources in advance and either avoid these resources or develop mitigation strategies to reduce the negative impact to the resource.

4.3.2.1 Impacts of Cultural Resource Decisions on Cultural Resources

Cultural resource decisions under the various alternatives include direct site protection and interpretation measures. Cultural resource decisions include provisions for establishing on- and off-site interpretive facilities at appropriate cultural resource sites in a manner that does not adversely impact the resource. Sites selected for interpretation would be ranked higher in public use values than in other site values such a scientific, conservation, or experimental values. Sites with high traditional values to Native American tribes would not be designated for interpretation unless tribal approval was granted. Decisions to provide interpretive facilities both on- and off-site have generally positive short-term effects on cultural resources within the VPA. Through interpretation, the public can be educated about the value of cultural resource sites and the necessity to refrain from damaging them.

Indirect effects to cultural resources from cultural resource decisions under many alternatives are limited. In the short-term, limiting OHV travel to designated routes in areas of high site density may encourage OHV users to move their activities to other areas. Additionally, limiting OHV travel to designated routes may increase traffic along the designated routes and indirectly impact resources. As such a small percentage of the VPA has been inventoried for cultural resource sites, it may not be possible to proactively assess the potential impact on cultural resources resulting from shifts in location of OHV activity in light of travel restrictions in some areas.

Indirect impacts may also result from decisions to provide on- and off-site interpretive facilities. Increasing the awareness of the public that cultural resources are present in a given area would encourage some land users to intentionally seek out cultural resource sites for exploration and looting. Such incidental impacts are, however, expected to be quite limited.

4.3.2.1.1 Alternative A

Cultural resource decisions under Alternative A would limit OHV travel to designated routes in areas of high cultural resource site density such as the Uintah Foothills (33,059 acres), Little/Devils Hole (10,878 acres), Upper Willow Creek (4,304 acres), and Four Mile Wash (ca. 560 acres). Such OHV travel prescriptions would reduce potential impacts to cultural resources as compared to the current management situation by reducing the frequency of OHV use as well as the intensity of surface disturbance related to OHV use. Additionally, OHV travel prescriptions should reduce the number of cultural resource sites that are exposed to OHV use overall. Oil and gas leasing would still be allowable in these areas under Alternative A.

Other cultural resource decisions under Alternative A include provisions for establishing on- and off-site interpretive facilities at appropriate cultural resource sites in a manner that does not adversely impact the resource.

4.3.2.1.2 Alternative B

Direct positive impacts to cultural resources resulting from cultural resource decisions under Alternative B are similar to those described for Alternative A, however, the magnitude of their impact is reduced for some decisions. Under Alternative B, on- and off-site interpretive facilities would still be developed, but they would only be established as part of mitigation of impacts for authorized or permitted activities; implementation of interpretive programs would not be proactive or independent of mitigation.

Decisions on the restriction of OHV travel to designated routes in areas of high cultural resource site density are identical to those described for Alternative A.

4.3.2.1.3 Alternative C

Cultural resource decisions under Alternative C are similar to those under Alternative A and would have a higher direct positive impact on cultural resources within the VPA than under any alternative. Cultural resource decisions under Alternative C would eliminate both oil and gas leasing and OHV travel in the areas of high cultural resource site density noted previously. The other action alternatives permit oil and gas leasing in these areas but restrict OHV travel to designated routes. The closure of these areas would significantly reduce potential and ongoing impacts to cultural resources as compared to the current management situation and other action alternatives by substantially reducing levels and frequencies of surface disturbance.

Under Alternative C, on- and off-site interpretive facilities would be established at all appropriate cultural resource sites in a manner that does not adversely impact the resource. Such interpretive facilities would be established proactively and independent of mitigation for authorized or permitted undertakings. Sites with high traditional values to Native American tribes still would not be designated for interpretation unless tribal approval was granted.

4.3.2.1.4 Alternative D – No Action

Under the current management situation, the four identified high cultural resource site density areas (Uintah Foothills, Little/Devils Hole, Upper Willow Creek, and Four Mile Wash) would be

open to oil and gas leasing with standard lease stipulations and OHV travel. Such a situation increases the possibility, over other alternatives, that important cultural resource sites would be damaged or destroyed by surface disturbance.

Under the current management situation, interpretive facilities would be developed at the Old Rock Saloon site and Nine Mile Canyon area. Further, a self-guided tour of important structures and locations in the Browns Park area would be implemented. The direct impact of such interpretive facilities on educating the public about good site stewardship would be similar to that described under Alternative A but would be somewhat reduced in scope as fewer facilities would be developed.

4.3.2.1.5 Summary – Cultural Resource Decisions

Overall, Alternative C provides that greatest positive benefit to cultural resources by eliminating oil and gas development and OHV travel in particular areas of high site density, and by establishing interpretive facilities at the greatest number of locales. Alternative A provides lesser positive benefit, in that oil and gas development would remain allowed in areas of high site density. Alternatives B and D – No Action, provide the least positive benefit to cultural resources in that many fewer restrictions are placed on development and OHV travel.

4.3.2.2 Impacts of Fire Management Decisions on Cultural Resources

Fire management decisions would primarily have direct and indirect effects that vary in kind over the short- and long-term. Depending on the flame height, temperature, and duration of fires, prescribed burns as well as associated pre-burn vegetation treatments and post-burn rehabilitation activities can have a negative impact on cultural resources by damaging or destroying combustible artifacts and features, damaging artifacts, features, rock art, aspen art, and sites through surface disturbance, altering the provenience of artifacts through surface disturbance, and altering the accuracy of scientific tests (e.g., radiocarbon, obsidian hydration, and residue analysis). These direct effects are the same over both the short- and long-terms. Furthermore, once denuded by prescribed fire, there may be additional negative impacts to cultural resources in the short-term due to increased erosion on archaeological sites, which can displace artifacts and reduce their interpretive value. Increased visibility of archaeological sites can also result in increased looting or artifact collection, which reduces the scientific value of the resource.

However, because prescribed fires often occur at a lower temperature than wildfires, prescribed fires are likely to result in less damage to cultural resources than would wildfires over the same area. Furthermore, all prescribed fire and associated activities with the potential to negatively impact cultural resources are also, subject to review and approval under Section 106 of the NHPA prior to implementation. Such review and approval requires the identification of NRHP listed and eligible cultural resources within the treatment area, evaluation of those resources for the NRHP, development of avoidance and/or mitigation protocols to ameliorate potential adverse impacts, and consultation with potentially effected Native American tribes. Such protections are not in place in the case of wildfires. Thus, overall, prescribed fires tend to have a greater positive benefit to cultural resources than wildfires, though they do involve limited negative impacts.

Reduction of surface cover through prescribed fire can also have a positive impact on knowledge of cultural resources within a given area by exposing previously unidentified cultural resource sites that were obscured by vegetation. The exposure of such sites allows for increased

knowledge regarding the overall archaeological record of the VPA and the more thorough identification of prehistoric and historic land use patterns. Thus, over the short-term, direct and indirect effects can include destruction of artifacts and other cultural resources by fire, and erosion can also occur. However, over the long-term, the reduction in intensity of fires combined with the increased knowledge of cultural resources that would occur as a result of surveys conducted prior to fires and increasing site visibility after fires would result in an increased benefit to cultural resources.

Under the current management situation, Alternative D –No Action, 27,950 acres in the Book Cliffs RMP and 22,950 acres in the Diamond Mountain RMP would be treated with prescribed fire and related activities for a total of 50,900 acres. Under Alternatives A, B, and C, prescribed fire would be allowed on approximately 156,425 acres per decade. Because a far greater number of acres are proposed for prescribed fire under Alternatives A, B, and C relative to Alternative D – No Action, all of these alternatives are likely to have greater positive direct impacts on cultural resources and reduced negative direct impacts relative to the current management situation.

4.3.2.3 Impacts of Lands and Realty Decisions on Cultural Resources

Land and realty decisions involve decisions to acquire and manage various lands and resources. For the most part, the lands and resources involved are currently managed under the same federal laws that apply to the BLM effects are likely to be minimal. Variations between the alternatives primarily relate the specific aspects of the proposed actions, and impacts are likely to be indirect and long-term rather than direct or short-term.

4.3.2.3.1 Alternative A

Under Alternative A, the BLM would pursue the acquisition of Indian trust lands near the confluence of South and Sweetwater Canyons and in the Bitter Creek area and would pursue public access at the mouth of Cowboy Canyon, Bonanza Bridge, and Wagon Hound Road. Because these lands are currently managed under the same federal laws that apply to the BLM, there are likely to be minimal changes from the current action in how cultural resource sites are protected or impacted. Additionally, under Alternative A, the BLM would pursue a locatable mineral withdrawal or other protective measures that would preclude mineral entry in the Green River Scenic Corridor in Browns Park (8,208 acres), the Lears Canyon relict vegetation area (1,377 acres), the White River area (9,218 acres), the Book Cliffs Natural Area (401 acres), and the lower Green River ACEC (17,063 acres). These actions would have a long-term, indirect positive impact on cultural resources within the VPA by reducing the number of cultural resource sites that are subject to mineral development. The effect of withdrawal of lands from mineral entry under the 1872 mining law as amended is a decrease in overall surface and subsurface disturbance within the withdrawn area. As the extent of surface and subsurface disturbance is the single greatest factor in predicting the potential for adverse impacts to cultural resources, an overall reduction in surface and subsurface disturbance through a mineral entry withdrawal would presumably reduce the overall potential negative impact to cultural resources.

4.3.2.3.2 Alternative B

Under Alternative B, the BLM would pursue only administrative access to Indian trust lands and would not pursue public access to the White River at the mouth of Cowboy Canyon, Bonanza Bridge, and Wagon Hound Road. Any administrative actions that would be considered federal actions would be subject to NHPA and other laws. Furthermore, land use decisions would have

to be coordinated with the Bureau of Indian Affairs, Native American tribes, and other landowners.

4.3.2.3.3 Alternative C

Lands and realty decisions under Alternative C are identical to Alternative A with the exception that the BLM would also pursue an easement for the old Uintah Railroad bed from the Utah/Colorado line to Watson in Evacuation Wash. The old Uintah Railroad bed is a known and documented historical cultural site. There are likely to be long-term beneficial indirect impacts as withdrawing lands from mineral development would reduce negative impacts over the area. Furthermore, the acquisition of the Uintah Railroad corridor by the BLM and the management of this historical site in accordance with federal law and agency guidelines affords some protection to this specific site by reducing potential negative impacts to it from private actions not subject to the same laws and guidelines.

4.3.2.3.4 Alternative D – No Action

Lands and realty decisions under Alternative D – No Action include locatable mineral withdrawal or other protective measures that would preclude mineral and agricultural entry on the Green River Scenic Corridor in Browns Park (19,400 acres), the relict vegetation areas (3,600 acres), the lower Green River ACEC (7,900 acres), and developed and potential recreation sites (5,000 acres). These withdrawals would afford protection to cultural resources in these areas by limiting surface disturbance. Overall, this alternative provides for approximately 400 fewer acres with locatable mineral withdrawal than Alternatives A-C.

4.3.2.3.5 Summary – Land and Realty Decisions

In summary, relative to unspecified decisions under the current management situation, Alternatives A, B, and C are all likely to provide long-term, indirect, and beneficial impacts to cultural resources in the Vernal area. Alternatives A and C are likely to have the greatest beneficial impacts, as both involve withdrawing lands from mineral developments in certain areas.

4.3.2.4 Impacts of Mineral Decisions on Cultural Resources

All minerals decisions under all alternatives have the potential to adversely impact cultural resources within the VPA as all decisions involve disturbing both surface and subsurface sediments that may contain cultural resources. However, it should also be noted that under all alternatives, all undertakings related to minerals development are subject to compliance with all federal cultural resource laws, including Section 106 of the NHPA, as well as agency guidance.

The difference in effects on cultural resources between the alternatives is in the numbers of acres open to minerals development. Because the precise location of any minerals development activity is not stipulated in this planning document, the assessment of potential affects is based on the overall potential acreage open for development with respect to high and low site probability zones. Table 4.3.1 provides the acreage for each type of development under each alternative with respect to probability of involvement within high and low site probability zones.

TABLE 4.3.1. SUMMARY OF MINERALS DEVELOPMENT RELATIVE TO HIGH AND LOW CULTURAL RESOURCE-SITE PROBABILITY ZONES

Oil and Gas Leases	Alternative A	Alternative B	Alternative C	Alternative D
Acres within High Site Probability Zones				
Standard Lease Terms	265,792	305,080	229,366	276,436
Timing and Controlled Surface Use	366,243	342,067	340,310	257,470
Total Open	632,035	647,147	569,676	533,906
No Surface Occupancy	32,787	27,808	34,063	65,671
Closed	43,878	33,745	104,961	33,735
Percent Change Relative to No-Action	18.4%	21.2%	6.7%	0.0%
Acres within Low Site Probability Zones				
Standard Lease Terms	718,845	808,035	629,242	641,891
Timing and Controlled Surface Use	427,327	364,214	428,167	360,244
Total Open	1,146,172	1,172,249	1,057,409	1,002,135
No Surface Occupancy	33,704	14,245	24,606	71,259
Closed	25,424	18,806	123,285	18,806
Percent Change Relative to No-Action	14.4%	17.0%	5.5%	0.0%

Special Tar Sands	Alternative A	Alternative B	Alternative C	Alternative D
Acres within High Site Probability Zones				
Standard Lease Terms	18,814	21,682	17,443	60,237
Timing and Controlled Surface Use	117,307	116,363	107,349	53,460
Total Open	136,121	138,045	124,792	113,697
No Surface Occupancy	4,781	2,857	2,745	5,828
Closed	25,345	25,345	38,710	25,347
Percent Change Relative to No-Action	19.7%	21.4%	9.8%	0.0%
Acres within Low Site Probability Zones				
Standard Lease Terms	32,842	39,742	26,086	55,971
Timing and Controlled Surface Use	83,701	81,875	88,218	47,818
Total Open	116,543	121,617	114,304	103,789
No Surface Occupancy	6,022	949	951	5,761
Closed	9,699	9,699	17,010	9,699
Percent Change Relative to No-Action	12.3%	17.2%	10.1%	0.0%

TABLE 4.3.1. SUMMARY OF MINERALS DEVELOPMENT RELATIVE TO HIGH AND LOW CULTURAL RESOURCE-SITE PROBABILITY ZONES

Other Minerals (Open)	Alternative A	Alternative B	Alternative C	Alternative D
Acres within High Site Probability Zones				
Oil Shale	80,181	81,098	78,271	75,596
Percent Change Relative to No-Action	6.1%	7.3%	3.5%	0.0%
Mineral Materials	169,476	173,050	154,096	157,137
Percent Change Relative to No-Action	7.9%	10.1%	-1.9%	0.0%
Phosphate	51,679	52,343	37,714	50,038
Percent Change Relative to No-Action	3.3%	4.6%	-24.6%	0.0%
Gilsonite (40‘ width)	226	453	226	217
Percent Change Relative to No-Action	4.1%	108.8%	4.1%	0.0%
Acres within Low Site Probability Zones				
Oil Shale	219,650	224,637	214,182	215,043
Percent Change Relative to No-Action	2.1%	4.5%	-0.4%	0.0%
Mineral Materials	245,907	257,108	224,683	230,563
Percent Change Relative to No-Action	6.7%	11.5%	-2.6%	0.0%
Phosphate	36,044	36,044	26,517	37,508
Percent Change Relative to No-Action	-3.9%	-3.9%	-29.3%	0.0%
Gilsonite (40‘ width)	611	1,224	608	601
Percent Change Relative to No-Action	1.7%	103.7%	1.2%	0.0%

Note: Acreages were calculated using GIS technology and there may be slight variations in total acres between disciplines. These variations are negligible and will not affect analysis.

It is important to note that not all minerals development activities would have the same impact on the landscape. Differing extraction processes would result in different surface-disturbances. In some cases, it is possible to provide additional analysis beyond simply estimating acres disturbed. For oil and gas and coal bed methane development, it is possible to project the estimated number of wells within each RFD area over the zones of high and low cultural resource site probability in order to estimate the likely disturbance within each cultural resource site probability zone of each RFD area (Table 4.3.2 and Table 4.3.3). This analysis results in a slightly more precise estimation of disturbance because it takes into account the differences in the distribution of projected development and the distribution of high and low cultural resource site probability zones. In essence, the analysis takes the percent of disturbance by wells relative to the total area open for development, applies that percentage to the acreages within high and low cultural resource site probability zones, and assumes that the disturbance within these zones is likely to be equal to the overall disturbance. In other words, the analysis assumes that

disturbance is equally likely to occur in any zone. It is then possible to estimate the probable disturbance in each area and assess this disturbance. Furthermore, it is also possible to estimate the total number of sites that would become either identified or exposed to potential disturbance under oil, gas, and coal bed methane development. As described in the introduction to this section, a conservative average of measures of archaeological site density results in an estimation of 4.87 sites/square mile in high site probability zones and 0.93 sites/square mile in low site probability areas. While it must be understood that these averages are nothing more than conservative estimates, they provide a means of assessing the probable numbers of cultural resource sites that may be involved during oil, gas, and coal bed methane well development (Table 4.3.4).

TABLE 4.3.2. ESTIMATED DISTURBANCE IN HIGH CULTURAL RESOURCE-SITE PROBABILITY ZONES BY OIL, GAS, AND COAL-BED METHANE DEVELOPMENT BY RFD AREA AND ALTERNATIVE

	Alternative A	Alternative B	Alternative C	Alternative D
Open Acres Within High Probability Zones for Cultural Sites*				
Monument Butte	187,085	190,624	187,235	155,475
East Tavaputs	227,627	228,189	193,791	173,014
West Tavaputs	41,590	48,962	42,157	42,427
Altamont	1,963	1,963	1,963	1,963
Tabiona	146,843	150,553	117,914	136,330
Manila	26,679	26,851	26,660	24,695
Total	***631,787***	***647,142***	***569,720***	***533,904***
Percent Potential Disturbance (Projected Total Disturbance based on Wells/Total Open Area)				
Monument Butte	2.3%	2.2%	2.3%	2.5%
East Tavaputs	0.4%	0.4%	0.5%	0.5%
West Tavaputs	0.6%	0.6%	0.6%	0.6%
Altamont	2.7%	2.7%	2.7%	2.7%
Tabiona	0.0%	0.0%	0.1%	0.0%
Manila	0.2%	0.2%	0.2%	0.2%
Total	***1.1%***	***1.0%***	***1.2%***	***1.2%***
Estimated Disturbance in High Probability Zones (Percent Disturbance*Acres in Zone)				
Monument Butte	4,229	4,249	4,244	3,844
Percent Difference from No Action	*10.0%*	*10.5%*	*10.4%*	*0.0%*
East Tavaputs	944	944	915	870
Percent Difference from No Action	*8.5%*	*8.5%*	*5.2%*	*0.0%*
West Tavaputs	253	277	259	260
Percent Difference from No Action	*-2.7%*	*6.3%*	*-0.6%*	*0.0%*
Altamont	53	53	53	54
Percent Difference from No Action	*-1.3%*	*-1.3%*	*-1.2%*	*0.0%*
Tabiona	67	68	63	66
Percent Difference from No Action	*1.9%*	*2.3%*	*-5.4%*	*0.0%*

TABLE 4.3.2. ESTIMATED DISTURBANCE IN HIGH CULTURAL RESOURCE-SITE PROBABILITY ZONES BY OIL, GAS, AND COAL-BED METHANE DEVELOPMENT BY RFD AREA AND ALTERNATIVE

	Alternative A	Alternative B	Alternative C	Alternative D
Manila	43	43	43	42
Percent Difference from No Action	*0.5%*	*0.6%*	*0.5%*	*0.0%*
Total	***5,589***	***5,633***	***5,576***	***5,137***
Percent Difference from No Action	*9.5%*	*9.7%*	*8.5%*	*0.0%*

TABLE 4.3.3. ESTIMATED DISTURBANCE IN LOW CULTURAL RESOURCE-SITE PROBABILITY ZONES BY OIL, GAS, AND COAL-BED METHANE DEVELOPMENT BY RFD AREA AND ALTERNATIVE

	Alternative A	Alternative B	Alternative C	Alternative D
Open Acres Within Low Probability Zones for Cultural Sites*				
Monument Butte	481,521	487,902	475,855	432,826
East Tavaputs	322,506	324,087	263,161	173,014
West Tavaputs	116,392	129,748	42,153	42,427
Altamont	12,218	12,218	12,218	12,004
Tabiona	191,172	196,727	170,697	181,311
Manila	21,523	21,604	21,517	17,818
Total	***1,145,332***	***1,172,286***	***985,601***	***859,400***
Percent Potential Disturbance (Projected Total Disturbance based on Wells/Total Open Area)				
Monument Butte	2.3%	2.2%	2.3%	2.5%
East Tavaputs	0.4%	0.4%	0.5%	0.5%
West Tavaputs	0.6%	0.6%	0.6%	0.6%
Altamont	2.7%	2.7%	2.7%	2.7%
Tabiona	0.0%	0.0%	0.1%	0.0%
Manila	0.2%	0.2%	0.2%	0.2%
Total	***1.1%***	***1.0%***	***1.2%***	***1.2%***
Estimated Disturbance in Low Probability Zones (Percent Disturbance*Acres in Zone)				
Monument Butte	10,883	10,874	10,785	10,702
Percent Difference from No Action	*1.7%*	*1.6%*	*0.8%*	*0.0%*
East Tavaputs	1,338	1,341	1,243	870
Percent Difference from No Action	*53.8%*	*54.1%*	*42.8%*	*0.0%*
West Tavaputs	709	733	259	260
Percent Difference from No Action	*172.3%*	*181.7%*	*-0.7%*	*0.0%*
Altamont	330	330	330	328
Percent Difference from No Action	*0.5%*	*0.5%*	*0.5%*	*0.0%*

TABLE 4.3.3. ESTIMATED DISTURBANCE IN LOW CULTURAL RESOURCE-SITE PROBABILITY ZONES BY OIL, GAS, AND COAL-BED METHANE DEVELOPMENT BY RFD AREA AND ALTERNATIVE				
	Alternative A	**Alternative B**	**Alternative C**	**Alternative D**
Tabiona	88	88	90	88
Percent Difference from No Action	*-0.3%*	*0.5%*	*2.9%*	*0.0%*
Manila	34	34	34	31
Percent Difference from No Action	*12.4%*	*12.2%*	*12.4%*	*0.0%*
Total	***13,382***	***13,401***	***12,742***	***12,279***
Percent Difference from No Action	*8.5%*	*9.1%*	*3.8%*	*0.0%*

TABLE 4.3.4. ESTIMATED NUMBERS OF CULTURAL RESOURCE SITES POTENTIALLY INVOLVED IN OIL, GAS, AND COAL-BED METHANE DEVELOPMENT BY RFD AREA AND ALTERNATIVE				
Estimated Number of Sites Potentially Encountered by Development				
	Alternative A	**Alternative B**	**Alternative C**	**Alternative D**
High Site Probability Zones*				
Monument Butte	32	32	32	29
East Tavaputs	7	7	7	7
West Tavaputs	2	2	2	2
Altamont	0	0	0	0
Tabiona	1	1	0	1
Manila	0	0	0	0
Subtotal	43	43	42	39
Low Site Probability Zones**				
Monument Butte	16	16	16	16
East Tavaputs	2	2	2	1
West Tavaputs	1	1	0	0
Altamont	0	0	0	0
Tabiona	0	0	0	0
Manila	0	0	0	0
Subtotal	19	19	19	18
Grand Total	16	16	16	16
*(Number of acres of potential disturbance/640 acres per square mile)*4.87 sites/square mile **(Number of acres of potential disturbance/640 acres per square mile)*0.93 sites/square mile				

Throughout this analysis, however, it is important to note that these numbers are produced through reasonable estimates of development and estimates of site density and location deriving from currently available data. Specific development or site location is unknown at this time.

Therefore, the assessment of effects here will be considered a relative assessment; in other words, more acres open to development within high site probability zones will be considered to provide a greater likelihood for some type of effect on cultural resources, even if the actual effect is small or negligible. It should be understood that, strictly in terms of the minerals decisions alone, no alternative benefits cultural resources.

Mineral decisions would involve direct and indirect effects on cultural resources. Direct effects to cultural resources resulting from mineral decisions under the alternatives are related to the level of surface and subsurface disturbance permitted under the decisions. The greater the level of permitted surface and subsurface disturbance, the greater the potential for encountering cultural resources. Short-term direct effects would entail surface disturbance and even destruction of archaeological sites and features if relevant cultural resources laws and agency guidelines are not followed, or if errors occur during the development process. Potential long-term direct effects on cultural resources include the physical alteration or elimination of archaeological sites as they are mitigated through data recovery or other on-site means when avoidance of the sites is not possible, as determined through the Section 106 process and through long-term changes in overall site settings as the number of wells and associated facilities increase. Avoidance of cultural resource sites is the preferred alternative under all scenarios. Although it is not possible to avoid the potential for irresolvable conflicts between any given specific proposed development in the future and archaeological sites, and although there is always potential for inadvertent discovery, historically, the ability to identify sites during the planning phase, and standard development stipulations that enable and promote site avoidance, has resulted in a relatively low rate of sites requiring mitigation and a very low rate of negative impacts to sites. According to the field office archaeologist, approximately 1% of the total cultural resource sites involved in oil and gas development have been negatively impacted by development (Blaine Phillips, personal communication 2004).

While sites within the area of potential direct effects will have been identified and either avoided or mitigated as part of the specific mineral development projects, sites not located within the footprints of undertakings are also vulnerable to negative impacts as human traffic in the general area increases. Potential indirect effects on cultural resources include vandalism and looting of cultural resource sites related to increased human activity within areas of mineral development. Other indirect negative impacts related to increased human activity in given areas include trampling of sites simply through the shear volume of individuals visiting sites. Additional potential indirect effects include increased erosion on cultural resource sites located in the vicinity of well pads, pipelines, and other minerals related facilities where vegetation cover has been reduced or eliminated.

4.3.2.4.1 Alternative A

Under Alternative A, oil and gas leasing would be open under standard lease terms or with timing and controlled surface use conditions on approximately 632,000 acres within the high site probability areas and approximately 1,146,000 acres within the low site probability areas (see Table 4.3.1). Based on projections of the numbers of wells, the size of each well and disturbance by associated facilities, approximately 20,000 acres would be subject to surface and subsurface disturbance over the short-term. The majority of this disturbance (approximately 15,000 acres) would be within the Monument Butte RFD area, with approximately 1,000-2,000 acres in the East and West Tavaputs and Altamont-Bluebell areas, and small acreages in the remaining Tabiona and Manila areas. Assuming that disturbance is equally likely in high and low site

probability areas, and that disturbance in these areas would be related to the overall disturbance relative to total land area, under Alternative A the estimated acreage of disturbance in the high site probability zones is approximately 5,600 acres, with more than two-thirds of this disturbance in the Monument Butte RFD area (see Table 4.3.2). Estimated acreage of disturbance in the low site probability zones is approximately 13,000 acres under Alternative A (see Table 4.3.3).

Alternative A reflects a 9.5% overall increase in oil, gas, and coal bed methane surface disturbance in the high cultural resource site probability zones relative to the No Action Alternative (see Table 4.3.2). Relative to the No Action Alternative, disturbance within high site probability zones would increase by 1-10% in several RFD areas, although it would decrease by 1-3% in the West Tavaputs and Altamont-Bluebell areas (see Table 4.3.2). The greatest increases are in the Monument Butte and East Tavaputs areas, with the greatest decrease in the West Tavaputs area. Alternative A is likely to result in encountering approximately 43 sites within high site probability zones and 19 sites in low site probability zones, or approximately 60-65 sites total (see Table 4.3.4). This is an estimated increase of about 10% more sites over the estimated 57 sites that may be exposed to analysis under the no-action alternative. It is important to note that these are the numbers of sites that are likely to be potentially encountered by development projects, and that they would not necessarily be disturbed. Given that only an estimated 1% of sites involved in minerals development are inadvertently disturbed, this alternative is likely to not result in significant disturbance to archaeological sites.

Impacts from projected development for special tar sands, oil, shale, mineral materials, phosphate, and gilsonite are much more difficult to quantify given that these projects have not been determined or set and are dependent on future technological advances and market needs, and that these developments involve different types of disturbances, and the disturbances are frequently more localized. Thus, assessment is best developed in terms of relative acres open to development. Based on the numbers of acres potentially open to development, Alternative A results in increases of between 3 and 20% in development in high cultural resource site probability zones relative to the No Action Alternative (see Table 4.3.1). The greatest potential increase is in special tar sands development, with other development projects generally only resulting in an increase of 2-10% relative to no-action. Projected impacts relative to phosphate development actually drops by almost 4% under Alternative A.

4.3.2.4.2 Alternative B

Under Alternative B, oil and gas leasing would be open under standard lease terms or with timing and controlled surface use conditions on approximately 647,000 acres within the high site probability areas and approximately 1,172,000 acres within the low site probability areas (see Table 4.3.1). Based on projections of the numbers of wells and the size of each well, approximately 19,000 acres would be subject to surface and subsurface disturbance over the short-term. The majority of this disturbance (approximately 15,100 acres) would be within the Monument Butte RFD area, with approximately 1,000-2,000 acres in the East and West Tavaputs and Altamont areas, and small acreages in the remaining Tabiona and Manila areas. Assuming that disturbance is equally likely in high and low site probability areas, and that disturbance in these areas would be related to the overall disturbance relative to total land area, under Alternative B the estimated acreage of disturbance in the high site probability zones is approximately 5,600 acres, with more than two-thirds of this disturbance in the Monument Butte RFD area (see Table 4.3.2). The greatest increase in acreage of potential disturbance relative to Alternative D – No Action is in the Monument Butte area, involving an additional 400 acres

potentially subject to disturbance. Estimated acreage of disturbance in the low site probability zones is approximately 11,000 acres under Alternative B (see Table 4.3.3).

Alternative B reflects an approximately 10% overall increase in oil, gas, and coal bed methane surface disturbance in the high cultural resource site probability zones relative to the No Action Alternative. Relative to the No Action Alternative, disturbance within high site probability zones would increase by 6-11% in several RFD areas, but would only increase by 0.6% the Manila area and would decrease by 1.3% in the Altamont-Bluebell area (see Table 4.3.2). Based on an estimation of site counts, Alternative B is likely to result in encountering approximately 43 sites within high site probability zones and 19 sites in low site probability zones, or approximately 62 sites total (see Table 4.3.4). It is important to note that these are the numbers of sites that are likely to be potentially encountered by development projects, and that they would not necessarily be disturbed.

In terms of development for special tar sands, oil, shale, mineral materials, phosphate, and gilsonite, Alternative B results in increases of between 5 and 108% in development in high cultural resource site probability zones relative to the No Action Alternative (see Table 4.3.1). However, potential development by phosphate exploration and recovery decreases by approximately 4% relative to the No Action Alternative. The greatest potential increase is in Gilsonite development, with other development projects generally only resulting in an increase of 5-21% relative to the No Action Alternative.

4.3.2.4.3 Alternative C

Under Alternative C, oil and gas leasing would be open under standard lease terms or with timing and controlled surface use conditions on approximately 570,000 acres within the high site probability areas and approximately 1,057,000 acres within the low site probability areas (see Table 4.3.1). Based on projections of the numbers of wells and the size of each well, approximately 18,000 acres would be subject to surface and subsurface disturbance over the short-term. The majority of this disturbance (approximately 15,000 acres) would be within the Monument Butte RFD area, with approximately 1,000-2,000 acres in the East and West Tavaputs and Altamont areas, and small acreages in the remaining Tabiona and Manila areas. Assuming that disturbance is equally likely in high and low site probability areas, and that disturbance in these areas would be related to the overall disturbance relative to total land area, under Alternative C the estimated acreage of disturbance in the high site probability zones is approximately 4,200 acres, with more than two-thirds of this disturbance in the Monument Butte RFD area (see Table 4.3.2). Estimated acreage of disturbance in the low site probability zones is approximately 12,700 acres under Alternative B (see Table 4.3.3).

Alternative C reflects an approximately 8.5% overall increase in oil, gas, and coal bed methane surface disturbance in the high cultural resource site probability zones relative to the No Action Alternative and an approximately 3.8% increase in disturbance in low cultural resource site probability zones. Relative to the No Action Alternative, disturbance in high cultural resource site probability zones would increase by 5-10% in several RFD areas, but would decrease by approximately 1-5% in the West Tavaputs, Altamont-Bluebell, and Tabiona RFD areas. Alternative B is likely to result in encountering approximately 42 sites within high site probability zones and 19 sites in low site probability zones, or approximately 60 sites total (see Table 4.3.4).

Based on the numbers of acres potentially open to development for special tar sands, oil, shale, mineral materials, phosphate, and gilsonite, Alternative C results in increases of between 1 and 10% in development in high cultural resource site probability zones relative to the No Action Alternative (see Table 4.3.1). Projected development in mineral materials, phosphate, and oil shale decreases between 1 and 30%, with the biggest decrease in the area of phosphate development.

4.3.2.4.4 Alternative D – No Action

Under Alternative D – No Action, oil and gas leasing would be open under standard lease terms or with timing and controlled surface use conditions on approximately 534,000 acres within the high site probability areas and approximately 1,002,000 acres within the low site probability areas (see Table 4.3.1). Based on projections of the numbers of wells and the size of each well, approximately 17,400 acres would be subject to surface and subsurface disturbance over the short-term. The majority of this disturbance (approximately 14,500 acres) would be within the Monument Butte RFD area, with approximately 1,000-2,000 acres in the East and West Tavaputs and Altamont areas, and small acreages in the remaining Tabiona and Manila areas. Assuming that disturbance is equally likely in high and low site probability areas, and that disturbance in these areas would be related to the overall disturbance relative to total land area, under Alternative D – No Action the estimated acreage of disturbance in the high site probability zones is approximately 5,100 acres, with more than two-thirds of this disturbance in the Monument Butte RFD area (see Table 4.3.2). Alternative D – No Action projects the lowest amount of disturbance in high cultural resource site probability zones of any of the alternatives, but the difference between Alternative D – No Action and Alternative B (which has the highest amount of proposed disturbance) is less than 1,000 acres. Estimated acreage of disturbance in the low site probability zones is approximately 12,300 acres under Alternative D – No Action (see Table 4.3.3). Combined, the disturbance is slightly lower than projected under Alternative C. Alternative D – No Action is likely to result in encountering approximately 39 sites within high site probability zones and 18 sites in low site probability zones, or approximately 55-60 sites total (see Table 4.3.4).

Based on the numbers of acres potentially open to special tar sands, oil, shale, mineral materials, phosphate, and gilsonite development, Alternative D – No Action has overall less projected oil shale, phosphate, and gilsonite development in high cultural resource site probability zones relative to the other alternatives, and slightly more mineral materials and phosphate development relative to Alternative C (see Table 4.3.1).

4.3.2.4.5 Summary – Minerals Decisions

Overall, based on the numbers of acres open for development and consideration of the likely lease areas, of the action Alternative C provides the greatest benefit to cultural resources. Alternative C would result in a lowest increase in potential for conflicts with cultural resource sites. Alternatives A and B have the greatest number of acres subject to potential disturbance of any of the alternatives. Alternative D does have the least number of total acres affected, but the Hill Creek Extension (188,500 acres) was not leased in the Book Cliffs RMP and therefore is not included in the total acreage calculations of Alternative D (No Action), which accounts for the difference. Overall, the relative increases to the No Action Alternative are generally around 10%, and a small additional number of sites are likely to be identified and subject to avoidance, mitigation, or potential impact through inadvertent discovery. It remains important to reiterate

that specific minerals development projects will undergo another level of analysis, and will therefore be subject to Section 106 review. Consequently, the potential for actual negative direct impacts to occur to cultural resources is low.

4.3.2.5 Impacts of Rangeland Management Decisions on Cultural Resources

Because of existing federal laws protecting cultural resources, the effect of rangeland management decisions on cultural resources within the VPA are likely to be minimal. The primary short- and long-term impacts to cultural resources would occur as result of surface and subsurface disturbance related to mechanical, chemical, and fire-related vegetation treatments, fencing, installation of guzzlers, creation of reservoirs, development of wells and springs, and installation of water pipelines. Although it is not possible to estimate the precise placement of these treatments and constructions, it is possible to estimate potential numbers of cultural resources involved in the treatments and constructions based on the acres associated. In general, increased acres of vegetation treatment would increase the possibility of involving cultural resources and raise the potential for adverse impacts. All rangeland improvements projects would require adherence to Section 106 of the NHPA and agency guidelines for the identification, evaluation, and protection of important cultural resource sites. As such, negative impacts to cultural resources from proposed rangeland improvements can either be avoided or mitigated.

Short and long-term indirect effects on cultural resources from rangeland improvement decisions are limited. It is anticipated that the primary negative indirect impact would be to increase the potential for concentrated trampling of cultural resource sites located in areas adjacent to fencing. As cattle, sheep, or other grazers walk back and forth along fence lines, their repeated footsteps typically wear entrenched trails which may pass through archaeological sites, and denude areas of vegetation thereby increasing erosion which would result in scouring or sheet washing of cultural resource sites in adjacent areas.

Utilizing the acreages for vegetation treatment and the acreages produced by the disturbance assumptions for fencing, pipelines, guzzlers, and wells, estimates of the numbers of acres proposed for the various actions and the probable numbers of cultural resource sites present were produced for the analysis (Table 4.3.5). Because each type of action has different chances of landing in high, medium, or low cultural resource site probability zones, different estimates for numbers of sites per square mile were used for each proposed action. Vegetation treatments, fences, and pipelines are likely to cross both high and low site probability zones. Thus, for the analysis an average number of 2.9 sites per square mile (midway between the high and the low estimates) were utilized for these types of actions. Guzzlers and wells, while not necessarily directly over natural sources of water, are often located near natural water sources. Cultural resource sites are much more likely to be present near natural water sources, so a high estimate of 4.87 sites per square mile were utilized for these actions. While it must be understood that these averages are nothing more than conservative estimates, they provide a means of assessing the probable numbers of cultural resource sites that may be in an area subject to vegetation treatment, fencing, guzzlers, etc.

TABLE 4.3.5. ESTIMATED ACRES AND POTENTIAL CULTURAL RESOURCE SITES ASSOCIATED WITH RANGELAND CONSTRUCTIONS AND VEGETATION TREATMENTS BY ALTERNATIVE

	Alternative A	Alternative B	Alternative C	Alternative D
From Rangeland Constructions				
Fencing	68.5	368.5	129	65
Acres	*34.25*	*184.25*	*64.5*	*32.5*
Pipeline	37.5	51	29.5	35
Acres	*37.5*	*51*	*29.5*	*35*
Subtotal Acres	***71.75***	***235.25***	***94***	***67.5***
*Estimated Sites**	*0*	*1*	*0*	*0*
Guzzlers	812	1165	811	775
Acres	*812*	*1165*	*811*	*775*
Wells	51	78	87	74
Acres	*51*	*78*	*87*	*74*
Subtotal Acres	***863***	***1243***	***898***	***849***
*Estimated Sites***	*7*	*9*	*7*	*6*
Total Acres	***934.75***	***1478.25***	***992***	***916.5***
Percent Change	*2.0%*	*61.3%*	*8.2%*	*0.0%*
Total Estimated Sites	**7**	**10**	**7**	**6**
From Vegetation Treatments				
Acres	34,640	50,900	45,860	40,390
Percent Change	*-14.2%*	*26.0%*	*13.5%*	*0.0%*
*Estimated Sites**	*157*	*231*	*208*	*183*

*Utilizes a moderate site density estimate of 2.9 sites/square mile
**Utilizes a high site density estimate of 4.87 sites/square mile

4.3.2.5.1 Alternative A

The level of potential surface and subsurface disturbance associated with these facilities under Alternative A include 34,640 acres of vegetation treatment, 68.5 miles of fencing, 37.5 miles of water pipeline, 51 well/spring developments, and 812 guzzler or reservoir projects. Relative to Alternative D – No Action, the current management situation, this action includes minor increases in the acres affected by rangeland constructions, with no significant increase in the numbers of sites potentially involved. Increases from guzzlers and wells are also minor, with only potentially one or a few additional sites involved. Vegetation treatments decrease by about 14% under this alternative relative to the no-action alternative, and are likely to involve to involve approximately 157 sites, or slightly fewer than under the no-action alternative. Fencing, pipelines, guzzlers, and wells are likely to involve approximately 7 sites, roughly comparable to Alternative D – No Action.

4.3.2.5.2 Alternative B

Under Alternative B 50,900 acres of would be subject to vegetation treatment, 368.5 miles of fencing would be installed, 51 miles of water pipeline would be installed, 78 well/spring developments would be undertaken, and 1,165 guzzler or reservoir projects would be completed. These acreages, miles, and numbers of facilities reflect an approximately 61 percent increase over the acreages proposed under Alternative D – No Action, the current management situation. Vegetation treatments increase by about 26% and are likely to involve approximately 230 sites, higher than under any alternative. Fencing, pipelines, guzzlers, and wells are likely to involve approximately 10 sites, slightly higher than Alternative D – No Action.

4.3.2.5.3 Alternative C

Under Alternative C a total of 45,860 acres of would be subject to vegetation treatment, 129 miles of fencing would be installed, 29.5 miles of water pipeline would be installed, 87 well/spring developments would be undertaken and 811 guzzler or reservoir projects would be completed. These acreages, miles, and numbers of facilities reflect an approximately 8% increase over the acreages proposed under Alternative D – No Action, the current management situation. Vegetation treatments are likely to involve approximately 210 sites, which is less than Alternative B, but higher than Alternatives A and D. Fencing, pipelines, guzzlers, and wells are likely to involve approximately 7 sites, roughly comparable to Alternative D – No Action.

4.3.2.5.4 Alternative D – No Action

Under Alternative D – No Action a total of 40,390 acres of would be subject to vegetation treatment, 65 miles of fencing would be installed, 35 miles of water pipeline would be installed, 74 well/spring developments would be undertaken and 775 guzzler or reservoir projects would be completed. Vegetation treatments are likely to involve approximately 180 sites, the second-fewest of any alternative. Fencing, pipelines, guzzlers, and wells are likely to involve approximately 6 sites, roughly comparable to the other alternatives.

4.3.2.5.5 Summary – Rangeland Management Decisions

Overall, Alternatives A and D are likely to have the lowest potential for negative impacts to cultural resources under any alternative. Alternative D – No Action has the lowest number of potential acres of vegetation treatment, fencing, and pipelines, and Alternative D – No Action has the second lowest number of sites potentially involved in guzzler or spring developments. Alternative A has the lowest number of sites potentially involved in developments, and an overall decrease of almost 25 sites potentially involved in rangeland activities relative to the no-action alternative. Thus, direct and indirect effects are likely to be lowest for these alternatives. Alternative C has a slightly greater increase in acreages and sites involved. Alternative B has the greatest increase in numbers of sites involved and is the alternative most likely to pose the greatest potential for direct and indirect negative impacts to cultural resources. However, due to the additional level of analysis provided by adherence to Section 106 of the NHPA and agency regulations, the potential for impacts to actually occur is low.

4.3.2.6 Impacts of Recreation Decisions on Cultural Resources

Direct effects to cultural resources resulting from recreation decisions are related to the level of surface and subsurface disturbance associated with recreational development and use and with the degree of increased human activity associated with said development and use. Increased human activity in areas where cultural resources are present also tends to correspond with

increased levels of vandalism and looting of said resources. In both the short- and the long-term, the greater the level of surface and subsurface disturbance associated with recreational development and use, the greater is the potential that cultural resources would be adversely impacted. Concomitantly, the greater the level of human activity, the greater is the potential for cultural resources within a recreational area to be adversely impacted by the shear volume of individuals walking over or visiting sites. Human activity, however, can occur in a managed setting, where recreational areas are developed and in an unmanaged setting where recreational use occurs as a result of other management decisions.

Additional long-term direct effects on cultural resources include the physical alteration or elimination of archaeological sites as they are mitigated through data recovery or other on-site means when avoidance of the sites is not possible for recreational development and use, as determined through the Section 106 process. The net effect of mitigating multiple sites in a given area when avoidance is not possible is the gradual alteration, and eventual elimination, of the overall archaeological record within the developed area. It should be noted, however, that mitigation of archaeological sites does have a limited positive effect in that new scientific knowledge of prehistoric and historic land uses within an area may be obtained in this manner. Other long-term direct impacts may include increases in levels of trampling and vandalism associated with increased human activity in given recreational areas. It should be noted, however, that regulated recreational use of areas tends to provide better protection to cultural resources than does unregulated use.

While sites within the area of potential direct effects would have been identified and either avoided or mitigated as part of specific development projects, sites not located within the footprints of undertakings are also vulnerable to negative impacts as human traffic in the general area increases. Potential indirect effects on cultural resources under include vandalism and looting of cultural resource sites related to increased human activity within areas of recreational development. Other indirect negative impacts related to increased human activity in given areas include trampling of sites simply through the shear volume of individuals visiting sites. Additional potential indirect effects include increased erosion on cultural resource sites located in the vicinity of trails, campgrounds, and other recreational facilities where vegetation cover has been reduced or eliminated and/or water runoff is not appropriately controlled.

4.3.2.6.1 Alternative A

Under Alternative A, 499,620 acres would be specifically managed as SRMAs in the following areas: Blue Mountain (42,758 acres); Book Cliffs (273,486 acres); Browns Park (52,720 acres); Red Mountain-Dry Fork (24,285 acres); Nine Mile Canyon (81,168 acres); Pelican Lake (1,020 acres); and White River (24,183 acres). These areas contain large numbers of acres within high cultural resource site probability zones (Blue Mountain-approximately 26,000 acres; Book Cliffs-approximately 197,000 acres; Browns Park-approximately 38,000 acres; Nine Mile Canyon-approximately 32,000 acres; White River-approximately 20,000 acres). Consequently, there is very good potential for cultural resource sites to occur in these zones, and negative impacts would continue to occur. However, the designation of a SRMA allows for the potential to manage these impacts, in contrast to the no-action alternative where for the most part these areas are used for recreation with little or no management. The proposed designations reflect a significant increase, 411,660 acres over the current acres (87,960) represented by SRMAs in the area.

All SRMAs would be managed according to the philosophy of multiple-use. Additionally, 400 miles of non-motorized trails would be improved and/or developed, and restrictions would be placed on the use of OHVs for retrieval of big game off of designated routes. A total of 800 miles of motorized OHV trails would be developed under this alternative. Also under Alternative A, a management plan would be prepared for the Fantasy Canyon SRMA, and this plan would include prescriptions for the protection of cultural resources with high scientific, experimental, conservation, and traditional values, and the interpretation of cultural resources with high public use values. Under Alternative A, new cabin construction would be allowed within the VPA. Alternative A incorporates substantially greater numbers of acres into SRMAs than does Alternative D – No Action. Alternative D generally allows for unrestricted and unconfined use of BLM lands for recreation. While the designation of SRMAs generally includes surface and subsurface disturbance related to recreational development and does increase human activity in given areas, such designations and associated development are subject to compliance with cultural resource laws, as noted previously. These designations also require the preparation of management plans that must include prescriptions for the protection of important cultural resource values. As such, even though Alternative A incorporates greater numbers of acres into SRMAs and miles into non-motorized and motorized trails, these designations include protocols designed to protect cultural resources.

4.3.2.6.2 Alternative B

As with Alternative A, direct effects to cultural resources resulting from recreation decisions under Alternative B are related to the level of surface and subsurface disturbance associated with recreational development and use and with the degree of increased human activity associated with said development and use. Under Alternative B, 44,181 acres would be managed as SRMA for Nine Mile Canyon, 24,285 acres would be managed as SRMA for Red Mountain-Dry Fork, 1,020 would be managed for Pelican Lake, and 18,474 acres would be managed as SRMA for Browns Park. This represents a total of 87,960 acres within formally designated SRMAs under Alternative B. All designated SRMAs would be managed according to the philosophy of multiple-use. Additionally under Alternative B, no non-motorized or motorized trails would be improved or developed, and OHV use off of designated trails would be allowed (with some limitations) for big game retrieval. Under Alternative B, no management plan would be prepared for the Fantasy Canyon SRMA, and unrestricted and unconfined recreational use of the Book Cliffs would continue as currently managed. Under Alternative B, new cabin construction would be allowed within the VPA in specific areas.

Alternative B is roughly comparable to Alternative D – No Action in terms of acres managed as SRMAs and miles developed for non-motorized and motorized trails. Alternative B generally allows for unrestricted and unconfined use of BLM lands for recreation. As noted above, such allowances tend to increase adverse impacts to cultural resources as compared to areas that are actively managed for recreational uses.

4.3.2.6.3 Alternative C

Under Alternative C, 522,636 acres would be specifically managed as SRMAs in the following areas: Book Cliffs (273,486 acres); Fantasy Canyon (69 acres); Browns Park (52,720 acres); Red Mountain-Dry Fork (24,285 acres); Nine Mile Canyon (81,168 acres), White River (47,130 acres), Blue Mountain (42,758 acres), and Pelican Lake (1,020 acres). These areas contain large numbers of acres within high cultural resource site probability zones (Blue Mountain-

approximately 26,000 acres; Book Cliffs-approximately 196,000 acres; Browns Park-approximately 38,000 acres; Nine Mile Canyon-approximately 32,000 acres, White River-approximately 40,000 acres, all of the acreages in Fantasy Canyon are considered low site probability zones). All designated SRMAs would be managed according to the philosophy of multiple-use, and unlike under other alternatives, portions of the Book Cliffs SRMA would be open to oil and gas development under Alternative C. Under Alternative C, 400 miles of non-motorized trails would be improved and/or developed, and restrictions would be placed on the use of OHVs for retrieval of big game off of designated routes. No motorized OHV trails would be developed under this alternative. Under Alternative C, no new cabin construction would be allowed within the VPA.

Compared to the other alternatives, Alternative C is roughly comparable to Alternative A although slightly fewer acres would be managed as SRMAs under Alternative A. None of the 69 acres proposed for the Fantasy Canyon SRMA fall within high site probability zones. The proposed designations reflect a substantial increase of acres over the current acres represented by SRMAs in the area.

4.3.2.6.4 Alternative D – No Action

Under Alternative D – No Action, 44,181 acres would be managed as SRMA for Nine Mile Canyon, 24,285 acres would be managed as SRMA for Red Mountain-Dry Fork, 1,020 acres would be managed as SRMA for Pelican Lake, and 18,474 acres would be managed as SRMA for Browns Park. This represents a total of 87,960 acres within formally designated SRMAs under Alternative D – No Action. All designated SRMAs would be managed according to the philosophy of multiple-use. Additionally under Alternative D – No Action, 55 miles of non-motorized trails would be improved or developed. The Red Mountain-Dry Fork trail would be managed as a motorized OHV trail. No specifications are given for OHV use off of designated trails for the retrieval of big game. Under Alternative D – No Action, development of a management plan for the Fantasy Canyon SRMA is unspecified as is the management of Blue Mountain as an SRMA. In general, Alternative D – No Action would allow for unrestricted and unconfined recreational use of most areas within the VPA. Under Alternative D – No Action, management of new cabin construction is unspecified.

4.3.2.6.5 Summary – Recreation Decisions

Overall, Alternatives A and C have the greatest potential for positive impacts to cultural resources. Both of these alternatives provide for a 400% increase in acres designated as SRMAs. Although there is potential for direct and indirect negative impacts from increased recreation under these designations, the potential for management of these impacts would be a positive overall benefit to cultural resources.

4.3.2.7 Impacts of Special Designation Decisions on Cultural Resources

Significant impacts to cultural resources from special designation decisions are direct, long-term, and generally beneficial. These positive impacts are related to the restriction of surface disturbing activities and limitations placed on land uses within areas of special designation. The reduction, control, or elimination of surface disturbing activities, such as oil and gas development and OHV travel, within large geographic areas affords significant protection to cultural resource sites and insures preservation of the important scientific, experimental, conservation, and traditional use values of these resources. Long-term direct positive impacts on

cultural resources from special designation decisions include increased protection of cultural resource use values through the overall reduction of surface disturbing activities within some of the specially designated areas. While a direct one-to-one correlation of acres disturbed to cultural resources encountered does not exist, relative ratios of higher numbers of acres disturbed to higher numbers of sites encountered and fewer acres disturbed to fewer sites encountered can be assumed. Thus, with the specific controls and restrictions placed on surface disturbing activities under some of the special designations, the long-term net effect would be an overall decrease in the numbers of sites subject to impacts, including those resulting from mitigation where avoidance is not possible. Furthermore, the designations may contribute to the preservation of site settings and view sheds, spiritual settings and values, and cultural resource site feelings and association and conservation of areas of tribal importance. There are no measurable short-term or long-term indirect effects on cultural resources resulting from special designation decisions.

4.3.2.7.1 Alternative A

Under Alternative A, the following areas (and acreages) are proposed for ACEC designation in addition to (or differing from) the current designations: Bitter Creek (71,000 acres), Browns Park (52,721 acres), Coyote Basin (87,743), Lears Canyon (1,377 acres), Lower Green River (10,170 acres), Nine Mile Canyon (48,000 acres), Pariette (10,437 acres), Red Creek (24,475 acres), Red Mountain-Dry Fork Complex (24,285 acres), and White River (17,810 acres). All of these areas, with the exception of Lears Canyon contain between 10,000 and 35,000 acres each within the zones of high potential for cultural resource sites. The acreages identified for each specially designated area represent increases over existing management acreages for established areas of special designation. Further, recommendation for designation of two segments of the White River, one segment of the Upper Green, and one segment of the lower Green River as wild and scenic rivers affords additional protection to cultural resources adjacent to said river segments as surface disturbing activities in these adjacent areas would be restricted to insure maintenance of those characteristics rendering these river segments eligible for special designation. Compared to Alternative D-No Action, Alternative A provides increased benefit to cultural resources.

4.3.2.7.2 Alternative B

Under Alternative B, the following areas (and acreages) are proposed for ACEC designation in addition to (or differing from) the current designations: Browns Park (18,475 acres), Coyote Basin (47,659 acres), Lears Canyon (1,377 acres), Nine Mile Canyon (44,181 acres), Pariette (10,437 acres), Red Creek (24,475 acres), and Red Mountain-Dry Fork Complex (24,285 acres). This constitutes a reduction in number of separate areas defined relative to Alternative A and it does not designate Lower Green River as does the no-action alternative. However, it does provide for establishment of special designation in Coyote Basin. Only the Upper and Lower Green would be recommended for designation as W&SR.

4.3.2.7.3 Alternative C

Under Alternative C, the following acreages are proposed for ACEC designation: Bitter Creek (68,834 acres), Bitter Creek/P.R. Spring (78,591 acres), Browns Park (52,721 acres),Coyote Basin-Coyote Basin (26,590) Coyote Basin-Kennedy Wash (10,670 acres), Coyote Basin-Myton Bench (36,670 acres), Coyote Basin-Shiner (21,957 acres), Coyote Basin-Snake John (28,274 acres), Four Mile Wash (50,280 acres), Lears Canyon (1,377), Lower Green River (10,170 acres), Main Canyon (100,915 acres), Middle Green River (6,768 acres), Nine Mile Canyon (81,168 acres), Pariette (10,437 acres), Red Creek (24,275 acres), Red Mountain-Dry Fork

Complex (24,285 acres), White River (47,130 acres). Between 1,000 and 75,000 acres within high cultural resource site probability zones are present in these proposed areas. Unlike decisions under the other three alternatives, decisions under Alternative C would also include the designation of 50,280 acres of land in the Four Mile Wash area as and ACEC/ONA, approximately 7,000 of these acres are within high cultural resource site probability zones.

Under Alternative C three segments of the White River would be recommended for wild and scenic designations, and one segment each of Nine Mile Creek, Argyle Creek, and the middle Green River would be recommended for wild and scenic designation with a classification of recreational. Additionally, one segment each of Evacuation Creek, the lower Green River, Nine Mile, and Bitter Creek would be recommended for wild and scenic designation with a classification of scenic. Further, the segment of the Green River between Little Hole and the Colorado State Line would be managed as a wild and scenic river with a classification of scenic until such time as Congress makes as decision as to whether or not to include this river segment in the national Wild and Scenic River system.

The overall nature of the direct effect of special designation decisions on cultural resources under Alternative C is similar to but greater than that described for Alternatives A and B. Under Alternative C, significantly higher numbers of acres would be designated as special status and would be subject to the restrictions and controls on surface and subsurface disturbance and land use that provide positive protective benefits to cultural resources within the designated areas. Under Alternative C, approximately 195,000 more acres within zones of high probability for cultural resource sites would be protected relative to Alternative A and approximately 210,000 more acres would be protected relative to Alternatives B and D.

4.3.2.7.4 Alternative D – No Action

The net positive direct effect of proposed ACEC designation on cultural resources under Alternative D – No Action is substantially less than those under all action alternatives. Under Alternative D – No Action, no new special area designations would be made. Only those existing ACECs of the Lower Green River west bank (8,470 acres), Browns Park (52,721 acres), Red Mountain-Dry Fork (24,285 acres), Nine Mile Canyon (44,181 acres), Pariette (10,437 acres), Red Creek (24,475 acres) and Lears Canyon (1,377 acres) would be managed according to special designation management restrictions and controls on surface disturbing activities and land uses. Also under Alternative D – No Action, the lower Green River found suitable for designation as wild and scenic would be managed as such. The segment of the Green River between Little Hole and the Colorado State Line would be managed as a wild and scenic river with a classification of scenic until such time as Congress makes as decision as to whether or not to include this river segment in the national Wild and Scenic River system.

4.3.2.7.5 Summary – Special Designation Decisions

Overall, Alternative C has the greatest potential long-term direct and indirect benefit to cultural resources of all the alternatives. Alternative A has the second-greatest benefit, followed by Alternative B, and Alternative D – No Action.

4.3.2.8 Impacts of Travel Decisions on Cultural Resources

Travel decisions, such as the designation of areas open, limited, or closed to OHV travel and the designation of travel routes can impact cultural resources in a number of ways. Negative direct effects can result from construction of new roads and trails that would disturb archaeological

sites, from allowing OHV travel in areas with cultural resource sites, or from allowing OHV travel and recreation use 300 feet off of designated routes resulting in disturbances to archaeological sites. Indirect effects can result from increased traffic in the area and the potential for the traffic along designated routes to develop into access to and subsequent travel over or even looting of nearby cultural resource sites.

However, there can also be benefits to cultural resources from travel decisions. Cultural resources located in areas closed for OHV use or with restrictions placed on OHV use would receive the greatest positive benefit by either eliminating or reducing the potential for travel-related damage to cultural resource sites by closing or re-routing travel ways around important cultural resource sites and restricting vehicular travel to those designated routes. Thus, with the specific controls and restrictions placed on travel activities under the travel decisions, the long-term net effect would be an overall decrease in the numbers of sites subject to impacts.

While there is not a one-to-one correlation between acreage of routes and exact numbers of cultural resources encountered, a basic ratio of acres of routes to sites encountered can be assumed such that the greater the acreage of disturbance the greater the potential for encountering cultural resources. For the purposes of analysis, areas of open, limited, or closed OHV travel were combined with zones of high and low cultural resource site probability to determine the probable numbers of acres potentially subject to negative impacts from OHV travel (Table 4.3.6). To determine potential impacts in areas where travel is limited to designated routes and 300 feet away from each route, a 300-foot zone was established on either side of the designated routes for each alternative, and the acreages within areas of high and low cultural resource site probability were calculated accordingly for each alternative (Table 4.3.7). An estimation of 4.87 sites/square mile in high site probability zones and 0.93 sites/square mile in low site probability areas was then applied to estimate the number of potential cultural resource sites involved under each alternative. While it must be understood that these averages are nothing more than conservative estimates, they provide a means of assessing the probable numbers of cultural resource sites that may be in an area open to OHV travel (see Table 4.3.6) or within the 300-foot area allowed for recreation use (and potential indirect negative impacts) associated with allowing limited travel on designated routes (see Table 4.3.6).

TABLE 4.3.6. ESTIMATED NUMBERS OF ACRES OPEN TO OHV TRAVEL AND LIMITED OHV TRAVEL IN HIGH AND LOW CULTURAL RESOURCE-SITE PROBABILITY ZONES, AND ESTIMATED NUMBERS OF CULTURAL RESOURCE SITES POTENTIALLY WITHIN OPEN OHV TRAVEL AREAS BY ALTERNATIVE

	Alternative A	Alternative B	Alternative C	Alternative D
Acres in High Site Probability Zones				
Open	236	236	236	261,120
Percent Change	-99.9%	-99.9%	-99.9%	0.0%
Potential Sites	*2*	*2*	*2*	*1911*
Limited	587,212	592,986	478,924	355,539
Percent Change	*65.2%*	*66.8%*	*34.7%*	*0.0%*
Acres in Low Site Probability Zones				
Open	5,966	5,198	5,198	526,700

TABLE 4.3.6. ESTIMATED NUMBERS OF ACRES OPEN TO OHV TRAVEL AND LIMITED OHV TRAVEL IN HIGH AND LOW CULTURAL RESOURCE-SITE PROBABILITY ZONES, AND ESTIMATED NUMBERS OF CULTURAL RESOURCE SITES POTENTIALLY WITHIN OPEN OHV TRAVEL AREAS BY ALTERNATIVE

	Alternative A	Alternative B	Alternative C	Alternative D
Percent Change	-98.9%	-99.0%	-99.0%	0.0%
Potential Sites	*9*	*8*	*8*	*765*
Limited	1,058,746	1,066,916	875,740	532,876
Percent Change	98.7%	100.2%	64.3%	0.0%
Total Open Acreage	6,202	5,434	5,434	787,820
Total Potential Sites	*11*	*10*	*10*	*2752*
(Note: Potential sites for areas associated with limited travel are estimated on the next table)				

TABLE 4.3.7. ESTIMATED ACRES AND POTENTIAL CULTURAL RESOURCE SITES ASSOCIATED WITH TRAVEL ROUTES AND THE 300-FOOT TRAVEL BUFFER BY ALTERNATIVE

	Alternative A	Alternative B	Alternative C	Alternative D
Within High Cultural Site Probability Zones				
Acres	49,554	49,370	46,604	68,852
Percent Change	*-28.0%*	*-28.3%*	*-32.3%*	*0.0%*
Potential Sites	*377*	*376*	*355*	*524*
Within Low Cultural Site Probability Zones				
Acres	71,748	71,746	69,102	91,699
Percent Change	-21.8%	-21.8%	-24.6%	0.0%
Potential Sites	104	104	100	133
Total Acres	*121,302*	*121,116*	*115,706*	*160,551*
Percent Change	*-24.4%*	*-24.6%*	*-27.9%*	*0.0%*
Total Potential Sites	*481*	*480*	*455*	*657*

4.3.2.8.1 Alternative A

Compared to the other action alternatives and to the current management situation, Alternative A provides moderate level of benefit to cultural resources within the VPA. Alternative A provides for the limitation of travel to designated routes for 1,643,475 acres of land. Approximately 240 acres would remain open to OHV travel in high cultural resource site probability zones and approximately 6,000 acres would remain open in low cultural resource site probability zones, a nearly 100% decrease in the amount of acreage open to unrestricted travel within each site probability zone (see Table 4.3.6). Based on the estimates for sites/square mile described above, approximately 11 sites may be present in these open areas and would continue to see impacts that may be already occurring (see Table 4.3.6). However, not all of these sites would necessarily continue to be impacted or would necessarily be newly impacted. The number of sites are also greatly reduced relative to the no-action alternative, which has approximately 2,600 sites within areas that are currently open to OHV travel.

Under Alternative A, multiple areas would have travel restricted to existing routes. Approximately 121,300 acres of land are located in or within 300 feet of either side of existing routes (see Table 4.3.7). This represents an approximately 25% reduction in open area overall relative to the No Action Alternative, with an approximately 28% reduction in open area within high cultural resource site probability zones (see Table 4.3.7). Based on reasonable projections of numbers of sites within high and low probability zones, this alternative would potentially expose approximately 480 cultural resource sites to ongoing impacts or potentially new impacts. However, this number is approximately 27% lower than the nearly 660 sites that are currently potentially subject to impacts.

4.3.2.8.2 Alternative B

Alternative B provides for the limitation of travel to designated routes for 1,659,901 acres of land currently open to unrestricted OHV travel, or a 99.5% decrease in areas open to travel. Approximately 240 acres would remain open to OHV travel in high cultural resource site probability zones and approximately 5,200 acres would remain open in low cultural resource site probability zones, a nearly 100% decrease in the amount of acreage open to unrestricted travel within each site probability zone (see Table 4.3.6). Based on the estimates for sites/square mile described above, approximately 10 sites may be present in these open areas and would continue to see impacts that may be already occurring (see Table 4.3.6). However, not all of these sites would necessarily continue to be impacted or would necessarily be newly impacted. The number of sites is also greatly reduced relative to the No Action Alternative, which has approximately 2,600 sites within areas that are currently open to OHV travel.

Under Alternative B, multiple areas would have travel restricted to existing routes. Approximately 121,500 acres of land are located in or within 300 feet of either side of existing routes (see Table 4.3.7). This represents an approximately 25% reduction in open area overall relative to the No Action Alternative, with an approximately 28% reduction in open area within high cultural resource site probability zones (see Table 4.3.7). Based on reasonable projections of numbers of sites within high and low probability zones, this alternative would potentially expose approximately 480 cultural resource sites to ongoing impacts or potentially new impacts. However, this number is approximately 27% lower than the nearly 660 sites that are currently potentially subject to impacts.

4.3.2.8.3 Alternative C

Alternative C provides for the limitation of travel to designated routes for 1,353,529 acres of land currently open to unrestricted OHV travel, or a 99.5% decrease in areas open to travel. Approximately 240 acres would remain open to OHV travel in high cultural resource site probability zones and approximately 5,200 acres would remain open in low cultural resource site probability zones, a nearly 100% decrease in the amount of acreage open to unrestricted travel (see Table 4.3.6). Based on the estimates for sites/square mile described above, approximately 10 sites may be present in these open areas and would continue to see impacts that may be already occurring (see Table 4.3.6). However, not all of these sites would necessarily continue to be impacted or would necessarily be newly impacted. The number of sites is also greatly reduced relative to the No Action Alternative, which has approximately 2,600 sites within areas that are currently open to OHV travel.

Under Alternative C, multiple areas would have travel restricted to existing routes, although Alternative C involves the least number of open acres. Approximately 115,700 acres of land are

located in or within 300 feet of either side of existing routes (see Table 4.3.7). This represents an approximately 28% reduction in open area overall relative to the No Action Alternative, with an approximately 32% reduction in open area within high cultural resource site probability zones (see Table 4.3.7). Based on reasonable projections of numbers of sites within high and low probability zones, this alternative would potentially expose approximately 455 cultural resource sites to ongoing impacts or potentially new impacts. However, this number is approximately 31% lower than the nearly 660 sites that are currently potentially subject to impacts under the no-action alternative. Alternative C provides for the greatest reduction in area open to travel and number of sites potentially subject to continued impacts.

4.3.2.8.4 Alternative D – No Action

Travel decisions under Alternative D – No Action are largely unspecified. No specific provisions exist for the repair, maintenance, upgrade, or realignment of roadways causing damage to resources. Designations do exist, however, for OHV use within the VPA under Alternative D – No Action. These designations provide the least protection to cultural resources of all the designations under all alternatives. Under Alternative D – No Action relative to the other alternatives, significantly more acres (787,859 acres) are open to unrestricted OHV use. Fewer acres (887,275 acres) are subject to restrictions on OHV use, and fewer acres (50,388 acres) are closed to OHV use. Based on the estimates of acreages and sites/square mile in high and low cultural resource site probability zones, under this alternative, approximately 2,750 sites are subject to potential new damage or to continuing damage from OHV use.

Under Alternative D – No Action, the largest number of travel routes and associated access areas would remain open. Approximately 161,500 acres of land are located in or within 300 feet of either side of existing routes (see Table 4.3.7). Based on reasonable projections of numbers of sites within high and low probability zones, this alternative would potentially expose approximately 660 cultural resource sites to ongoing impacts or potentially new impacts.

4.3.2.8.5 Summary – Travel Decisions

Overall, Alternatives A, B, and C, while containing some potential for impacts to cultural resource sites to occur or continue to occur, all greatly reduce the amount of impacts relative to the current management situation. Alternative C provides the greatest benefit to cultural resources by increasing the areas closed to unrestricted travel by 700%. Alternative A follows in benefit, with Alternative B providing the least amount of benefit to cultural resources.

4.3.2.9 Impacts of Vegetation Decisions on Cultural Resources

Vegetation decisions under all alternatives are identical to those described previously for Fire Management. As the impacts of such decisions on cultural resources have already been described, they would not be reiterated here.

4.3.2.10 Impacts of Visual Resource Management Decisions on Cultural Resources

There are no measurable short-term or long-term direct effects on cultural resources resulting from visual resource management decisions. Significant impacts to cultural resources from visual resource management decisions under the alternatives are direct and beneficial over the long-and short-term. These positive impacts are related to the restriction of surface disturbing activities and limitations placed on land uses within areas of high VRM class values. The reduction, control, or elimination of surface disturbing activities, such as oil and gas development, OHV travel, mechanical vegetation treatments, prescribed fire, etc. within large geographic areas to

preserve high VRM values affords significant protection to cultural resource sites and insures preservation of the important scientific, experimental, conservation, and traditional use values of these resources.

While a direct one-to-one correlation of acres disturbed to cultural resources encountered does not exist, relative ratios of higher numbers of acres disturbed to higher numbers of sites encountered and fewer acres disturbed to fewer sites encountered can be assumed. Thus, with the specific controls and restrictions placed on surface disturbing activities in areas managed as the two highest VRM classes, the long-term net effect would be an overall decrease in the numbers of sites subject to impacts, including those resulting from mitigation where avoidance is not possible.

4.3.2.10.1 Alternative A

Under Alternative A, 67,357 acres would be managed as VRM Class I, the highest level of VRM value and the one with the most limitations on the nature of surface disturbing activities. Another 446,287 acres would be managed as VRM Class II, 1,091,814 acres would be managed as VRM Class III, and 868,542 acres would be managed as VRM Class IV, the least restrictive visual resource management class. Compared to the other alternatives, Alternative A provides the second highest level of overall direct benefit to cultural (behind Alternative C) as a total of 513,644 acres would be managed as the two highest VRM classifications. Visual resource management decisions under Alternative A provide a greater benefit to cultural resources than do those under Alternatives B and D.

4.3.2.10.2 Alternative B

Under Alternative B, 56,127 acres would be managed as VRM Class I, and 230,674 acres would be managed as VRM Class II. Another 300,376 acres would be managed as VRM Class III, and 1,88,822 acres would be managed as VRM Class IV. Compared to the other alternatives, Alternative B provides the third greatest level of benefit to cultural resources with 286,801 acres managed as the two highest, and most restrictive, VRM classes. Visual resource management decisions under Alternative B provide the same benefit as those under Alternative D – No Action but less than those under Alternatives A and C.

4.3.2.10.3 Alternative C

Under Alternative C, 148,260 acres would be managed as VRM Class I, and 620,630 acres would be managed as VRM Class II. Another 861,281 acres would be managed as VRM Class III, and 843,829 acres would be managed as VRM Class IV. Compared to the other alternatives, Alternative C provides the greatest level of benefit to cultural resources with a total of 768,890 acres managed as the two highest, and most restrictive, VRM classes.

4.3.2.10.4 Alternative D – No Action

Indirect effects of visual resource management decisions on cultural resources under Alternative D – No Action would be substantially less than that described Alternatives A and C. As impacts to cultural resources are generally related to the level of surface and subsurface disturbance in a given area, the lower number of acres managed as either VRM Class I or VRM Class II under Alternative D – No Action provides less protection to cultural resources within the VPA. Under Alternative D – No Action, 56,127 acres would be managed as VRM Class I, and 230,330 acres would be managed as VRM Class II. Another 300,656 acres would be managed as VRM Class III, and 1,886,887 acres would be managed as VRM Class IV. Compared to Alternatives A and

C, Alternative D – No Action provides the lowest level of benefit to cultural resources with a total of 286,457 acres managed as the two highest, and most restrictive, VRM classes.

4.3.2.11 Impacts of Wildlife and Fisheries Decisions on Cultural Resources

Wildlife and fisheries decisions under the various alternatives have negligible direct impacts on cultural resources within the VPA. Potentially significant impacts to cultural resources from wildlife and fisheries decisions under the alternatives are indirect, long-term, and beneficial. These positive impacts are related specifically to those decisions placing restrictions on surface disturbing activities and limitations on land uses within areas of crucial deer winter range. The reduction or control of surface disturbing activities, such as oil and gas development and OHV travel, within large geographic areas to preserve crucial deer winter range affords significant protection to cultural resource sites and insures preservation of the important scientific, experimental, conservation, and traditional use values of these resources.

4.3.2.11.1 Alternative A

Alternative A, new surface disturbance of up to 560 acres per township would be allowed and would be prorated based upon the percentage of the range within that township that functions as crucial winter range. Under Alternative A, the 560 acres represent new surface and subsurface disturbance over and above existing disturbance. This decision under Alternative A provides greater benefit to cultural resources than do decisions under Alternative B but slightly less than decisions under Alternative C. Similar decisions are unspecified under Alternative D – No Action.

4.3.2.11.2 Alternative B

Under Alternative B, new surface disturbance of up to 10% of the crucial deer winter range would be allowed. As such, this alternative provides less net benefit to cultural resources as do Alternatives A and C.

4.3.2.11.3 Alternative C

Under Alternative C, surface disturbance in crucial deer winter range would be capped at 560 acres per township (prorated based upon the percentage of the range within that township that functions as crucial winter range). This 560-acre cap includes both new and existing surface and subsurface disturbance. This decision under Alternative C provides greater benefit to cultural resources than do decisions under and other alternatives.

4.3.2.11.4 Alternative D – No Action

Wildlife and fisheries decisions related to surface and subsurface disturbance in crucial deer winter range are unspecified under Alternative D – No Action.

4.3.3 Mitigation Measures

All undertakings based on decisions set forth under all alternatives analyzed herein for the VPA RMP are also subject to compliance with cultural resource laws, such as Section 106 of the NHPA, as well as internal agency guidelines. These laws and guidelines are intended to provide considered alternatives to eliminate, reduce, and/or mitigate adverse impacts to cultural resources. Although the preferred treatment of important cultural resources within an area of an undertaking is complete avoidance, this is not always possible. As such, mitigation of impacts is offered as an alternative to avoidance. While avoidance helps to preserve the physical

archaeological record within an area, mitigation would result in the gradual elimination of the physical archaeological record and its conversion into a paper or archival record.

4.3.4 Unavoidable Adverse Impacts

Because the location and nature of all cultural resources in the area under consideration are unknown, it is not possible to determine if there would be unavoidable adverse impacts to cultural resources and/or what these impacts might be. There is some potential for unavoidable adverse impacts from nearly any proposed management decision. However, following the relevant cultural resource laws would provide opportunities for mitigation of many of these impacts.

4.3.5 Short-term Uses Versus Long-term Productivity

Because the location and nature of all cultural resources in the area under consideration are unknown, it is not possible to determine if there would be changes in short-term uses or long-term productivity of these resources.

4.3.6 Irreversible and Irretrievable Impacts

Because the location and nature of all cultural resources in the area under consideration are unknown, it is not possible to determine if there would be irreversible and/or irretrievable impacts to cultural resources and/or what these impacts might be. There is the potential for impacts from nearly any proposed management decision. However, following the relevant cultural resource laws would provide opportunities for mitigation of many of these impacts.